REMARKS

This responds to the Office Action mailed on January 19, 2007.

Claims 25, 36 and 48 are amended. Claims 25-48 are now pending in this application.

§102 Rejection of the Claims

Claims 25-47 were rejected under 35 U.S.C. § 102(b) as being anticipated by Xu et al. (US 5,563,902). This rejection is respectfully traversed at least because each and every element of the claimed invention is not shown or taught in Xu et al.

Xu et al., describes a structure that is a laser. In other words, the layers of Xu et al., work together to cause lasing when carriers are injected into the structure. The claims of the present application are for a modulator. Light is modulated by changing the refractive index of a waveguide using carrier injection. Light is not created, but is modulated. FIG. 1 of the application shows a modulator that receives light, modulates it, then outputs the light. FIG. 1 is only referenced to show the support for the term modulator.

Each of the claims specifically refers to a structure where a p-i-n diode is formed with an optical resonant or resonator cavity serving as the **non-active** intrinsic portion of the diode or serving to **change the refractive index** of the cavity. This structure allows the control of the refractive index of the resonator by controlling the carrier concentration within the resonator. It is not an active region, and does not produce light. It serves to vary the refractive index of the cavity, not produce light.

The Office Action refers to an optical resonant cavity 25 as an intrinsic region of a PIN diode per Col. 3, lines 22-30. However, "GaAs layer 25 is doped with p dopant at a concentration level of 1014/cm3." Many times, it is referred to as an active layer, at least at: Col. 2, line 4; Col. 3, lines 25-28; Col. 3, lines 57-58; Col. 3, line 67; Col. 4, lines 37-41; Col. 4, line 64; Col. 5, lines 26-40: "The intrinsic channel formed in laser 10 at GaAs layer 25' becomes highly conductive because the laterally injected charge carriers...thus forming a low resistance channel therein.". The active layer 25 serves to produce optical gain, and is not designed to vary the refractive index of a cavity. It does not serve as the non-active "I" layer of a p-i-n diode of a light modulator and no such structure as claimed, is formed. In addition, the structure of Xu et al., contains different layers of different materials (GaAs and AlGaAs) to form an active layer for

lasing, not for changing the refractive index of a waveguide. Thus, the overall structures of Xu et al., and the claims is very different, and serve an entirely different function.

Since the structure, as at least partially defined by the function of not including an active area or serving to vary the refractive index is not shown in Xu et al., a prima facie case of anticipation can not be established, and the rejection should be withdrawn.

§103 Rejection of the Claims

Claim 48 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Xu et al. (U.S. 5,563,902). Claim 48 has been amended similarly to claim 1 and is believed to distinguish from Xu et al., for at least the same reasons as claim 1. Further, it is not obvious to modify the structure and function of Xu et al., to arrive at the structure claimed in claim 48, since they provide entirely different functions, lasing versus modulation. Xu et al., creates light, and the structure of claim 48 modulates light.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 373-6972 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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Date 4-19-2007 By _____
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Mail Stop Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 19th day of April 2007.

Dawn M. Poole _____

Name Signature